

DEPARTMENT OF BRIDGES

GUSTAV LINDENTHAL, Commissioner of Bridges

PLANS FOR

Stations, Approaches and Connections

FOUR EAST RIVER BRIDGES

NEW YORK CITY

April 1, 1902

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INTRODUCTORY.

The estuary (East River) separating the Boroughs of Brooklyn and of Queens from the Borough of Manhattan is at present crossed by only one bridge. It has the southernmost location, and is known as the Brooklyn Bridge (completed May 23d, 1883).

Three additional bridges are under construction, and are here named in the order of their location northward from the Brooklyn Bridge:

The Manhattan Bridge, completion expected within five years;

The Williamsburg Bridge, completion expected in October, 1903; and

The Blackwell's Island Bridge, completion expected within four years.

All these bridges have or will have promenades, roadways for wagons, tracks for elevated railroad trains, and for surface cars.

The passenger traffic over the Brooklyn Bridge is growing in leaps and bounds. The terminal facilities have not kept pace with this increase, and long ago became inadequate. The experience on the Brooklyn Bridge has taught the necessity of avoiding, if possible, any terminals at all at the ends of the bridges. They should be and remain thoroughfares, like other avenues, for every kind of street traffic.

There should be fast trains over the bridges and over the elevated railroad connections. All stations should be through stations, several of them along the approaches, to scatter the crowd and to prevent congestion at the bridge entrances. In place of the surface cars during the rush hours mornings and evenings more radical and efficient means of transportation than any so far used should be adopted, to carry away the crowds as fast as they arrive at the bridges. That, in short, is the meaning of the plans hereinafter described.

THE PRESENT BROOKLYN BRIDGE TERMINAL:

The passenger transportation over this bridge is conducted by the Brooklyn Rapid Transit Company under contracts with the city. This company controls practically all elevated railroads and surface car lines in Brooklyn, and it also expects to control the transportation of passengers over the Williamsburgh and Manhattan bridges. The dealings of the city with a monopoly of this kind brings up necessarily some serious questions of policy and compensation for the use of the bridges and approaches thereto, and which will be again herein referred to later.

ELEVATED TERMINAL:

There are four tracks on the bridge—two inner tracks for trains and two trolley tracks. On the inner tracks the trains (of two to four cars) are run from one end of the bridge to the other and return. Wire-cable traction is used, supplemented by electric motor cars for switching purposes at both end stations.

The extra large cars of these trains are called bridge cars, and they carry about two-thirds of the passenger traffic. The other third is carried on the surface cars. Passengers from the bridge cars change at the Brooklyn terminus to or from the elevated cars in Brooklyn. At irregular intervals certain electric trains from the Brooklyn elevated railroads run through over the Bridge; but not in rush hours.

SURFACE CARS.

The two other tracks are laid on the two roadways for vehicles, and are used by the surface street cars (overhead trolleys), which run from all parts of Brooklyn to a four-loop terminal at the Manhattan end of the Bridge, on a level with the roadway.

Although the surface cars carry the smaller proportion of the passenger traffic, they are the most prolific cause of congestion and danger at this terminal during the afternoon rush hours. There is no such trouble overhead with the bridge-train terminals, because the cars run only from one end of the bridge to the other. There is here only one kind of crowd—always going only one way—and there is no waiting.

INSUFFICIENT SURFACE CAR TERMINALS :

The case is dissimilar with the surface cars, of which seventeen distinct lines come over the Bridge. Seventeen different crowds form at the four loops, each crowd waiting for its particular car, and all on a space hardly large enough for a single crowd or line.

The result is great confusion and crowding, repeated every afternoon on work days, between 5 and 6.30 P. M.

The same dense crowds arrive at the Manhattan terminal in packed cars during rush hours in the morning, but they immediately melt away and form no congestion.

This is proof that the track capacity over the Bridge is ample at least for present needs, and that the only trouble is with the insufficient terminal capacity, and that only for the surface cars. If they could leave the Bridge property and loop around in the streets of Manhattan (which is, however, not practicable at all), and if the Bridge were used only as a thoroughfare, just as Broadway is, no Bridge crush would ever be heard of. The open cars used in warm weather can be more quickly loaded and unloaded, and there is then less of a crush than during the colder season, when closed cars are used.

RESPONSIBILITY FOR BRIDGE CRUSH :

The bad condition in the afternoon rush hours at the surface-car terminal came about gradually. In 1898 only five lines of surface cars crossed the Bridge at first; then one line after another was added by the Brooklyn Rapid Transit Company ahead of their facilities for handling them at the loop terminal.

That company is operating the surface cars over the Bridge under contracts with the city. The rights of the city to interfere in the operation of the traffic, or for the correction of abuses—one of which is the crowding of so many different trolley lines into a small terminal—were not satisfactorily safe-guarded in these contracts. The Commissioner of Bridges is practically powerless to prevent them. Lack of systematic preparations on the part of that

company for the growth of its traffic and disregard of the comfort of passengers brought about gradually the present intolerable conditions.

IMMEDIATE RELIEF:

Any enlargement of the surface-car terminal on the limited Bridge property will give only insufficient and temporary relief, and the Brooklyn Rapid Transit Company, under the existing contracts with the city, must pay for same. The practical effect of it is, that no improvement in the existing conditions can be brought about without the consent of that company. It has been proposed to put four additional loops at the Manhattan end. Under the existing contracts with the city that company has to obtain all necessary consents, prepare all plans and pay for all the work.* For any neglect of that company to remedy the evil, the city has but one recourse, namely: To abrogate the existing contract and remove the surface cars from the Bridge on ninety days' notice. The company itself is not likely to cancel the contract, under which it pays to the city a toll of only five cents per round trip of a car. The traveling public would probably object to removing the surface cars from the bridge, unless other ample means for riding over it were provided in advance.

Any new contract should place more power in the hands of the city authorities for regulating the surface car traffic, and should also provide for more adequate compensation to the city for the use of the bridge.

*Paragraphs 1, 3 and 4 of the contract between the Trustees of The New York and Brooklyn Bridge and the surface railroad companies using the bridge, dated August 23, 1897, under which the surface cars are now operated upon the Brooklyn Bridge, provide: That the cost of all construction required to enable the said cars to run upon the bridge, and of all changes in and additions to the bridge, the approaches and the terminals, in order to permit the operation of such cars upon the bridge, shall be borne by the surface railroad companies; and that said surface railroad companies shall prepare the plans and do and pay for the work of said construction.

Paragraph 4 of said contract provides, that all rights of way, franchises and property necessary to be secured in order to construct the tracks upon which to enter and leave the bridge property, shall be secured and paid for by the said surface railroad companies.

Paragraph 8 of said contract provides, that said railroad companies shall protect and hold harmless the said Trustees from and against all losses, damages, claims and expenses of every nature resulting from injuries to person or property by reason of the operation of such surface cars upon the bridge, or from any failure or delay on the part of said railroad companies, promptly and regularly to operate and transport such cars over the bridge, or of any deprivation to owners of property adjoining the bridge of light or air, or interruption of either.

PERMANENT RELIEF:

Permanent relief requires time for construction. It can be best given by large and well-ordered through stations and a system of bridge approaches, with way stations for spreading the crowds. This applies to the Brooklyn Bridge as well as to the three new East River bridges, all of which (one after another) will be completed within the next five or six years. The first great relief will be obtained through the completion of the Williamsburg Bridge, expected October, 1903.

MANHATTAN ELEVATED RAILROAD TERMINAL:

No plan for permanent relief would be complete, which did not also make provision for the enlargement of the over-crowded Manhattan Elevated Railroad Station. It is under the same roof with and overlapping the Brooklyn Bridge terminal. The public is interested, and demands relief at one point as much as at the other. A large proportion of passengers interchange from one station to the other all day long.

The problem is somewhat complicated through the fact that the Manhattan Elevated Railroad terminal belongs to a private corporation, while the Bridge terminal belongs to the city, and is operated by another corporation—the Brooklyn Rapid Transit Company, as before said. But it is possible, and it is expected to harmonize all those interests in the plans herein proposed.

FORMER PLANS:

The question of traffic congestion has been repeatedly investigated in the past. Last year by a board of three expert engineers, who rendered a report October 8th, 1901; and, also, by Mr. C. C. Martin, then the Chief Engineer of the Brooklyn Bridge, whose report is dated November 25th, 1901. But both of these reports ignored the conditions at the Manhattan Elevated Railroad station; and they also neglected to provide for the dry goods district on the west side of Manhattan Borough, where a very large number of passengers living in Brooklyn have their

working places. Both reports recommended a four-track elevated railroad on Centre street for the connection of the three suspension bridges, which would needlessly ruin the costly and architecturally monumental city property on that street.

The estimates of cost in both reports are based on the same kind of structures as those now existing in the streets of New York; and do not provide for adequate compensation to the city for the despoliation of its costly buildings on Centre street.

CENTRE STREET PLAN ILLEGAL:

It was supposed that authority for the erection of this elevated railroad on Centre street was conferred under the so-called "McCarren Act"—Chapter 712, Laws of 1901; but the legal aspect of this question was investigated by the Corporation Counsel, and it set forth clearly in an opinion, furnished to the Bridge Department, under date of March 4th, 1902. The following is quoted therefrom:

"It is evident that this railroad is in no sense an 'extension' of the Manhattan terminal of the New York and Brooklyn Bridge.

"It is simply a street railroad connecting the bridge with the two other bridges already mentioned.

"If the act authorized such a construction as this it would be unconstitutional. but, as I have said, I do not think the act, while broad in its terms, confers any such right.

"Nothing can be done under it which is not an 'extension' of the bridge or an improvement of its terminal facilities.

"I have to advise you, therefore, that the plan" * * * "so far as it recommends the construction of the railroad, cannot legally be carried out."

The Commissioner of Bridges, under the opinion of the legal adviser of the city, has, therefore, no power to proceed with any of the above-named plans on Centre Street, or any other street. It is believed that the Board of Rapid Transit Commissioners have the needed authority for the enlargement of the elevated railroad

on Park row and the Bowery. It is already in existence and only needs reconstruction. It has, moreover, the advantage that the compensation for damage to property will be less than on any new route.

PERMANENT BRIDGE TERMINAL PLANS:

In a general way the permanent relief plan (see maps A, B and C) proposes to greatly increase the capacity of the present Brooklyn Bridge station, combine it with the City Hall station of the Manhattan Elevated Railroad and connect it with the Williamsburg Bridge over the existing Manhattan Elevated Railroad route on Park row and the Bowery, branching off through Delancey street to the said bridge. Elevated railroad trains will thus be able to run from the bridge station to Brooklyn in two directions.

The bridge station will no longer be a terminus, but a station for through trains running on both bridges and in either direction.

The permanent plan provides also for an approach on Canal street to the Manhattan Bridge (see map E) directly across Manhattan borough. That bridge will then reach a wider region and be of even greater value to Brooklyn traffic than the existing Brooklyn Bridge.

The improvement will successively comprise:

(1) An enlargement of the present elevated Brooklyn Bridge terminus to about five times its present train capacity.

(2) Under the same roof, a commodious terminus for the Manhattan Elevated Railroad of several times the present capacity of the existing City Hall station.

(3) An elevated railroad connection between the existing Brooklyn Bridge and the new Williamsburg Bridge, by way of Park row and the Bowery, and a terminus for the new bridge at Tryon row. This will require the rebuilding of the existing elevated railroad from Chambers street to Delancey street.

(4) A direct connection from the Bridge station at Tryon row, by way of Second avenue, to the new Blackwell's Island Bridge.

(5) A subterranean connection from the underground railroad to the Brooklyn Bridge station.

(6) The removal of the present unsightly bridge buildings, both in Manhattan and in Brooklyn, and the replacing of the same with serviceable and useful structures possessing architectural merit.

(7) An approach and terminus to the Manhattan Bridge, by means of a two-track elevated railroad along Canal street, through the dry goods district, with a return loop near West street.

(8) In lieu of surface cars, or in addition to them, on the three East River suspension bridges, moving platforms to be used in rush hours only.

ADDITIONAL PROPERTY REQUIRED:

In order to secure the necessary space for the enlarged terminal station of the Brooklyn Bridge, the city should acquire (see map C) the entire block of real estate fronting upon Tryon row, as well as the so-called "Triangle" between William street and Park row; also parts of the two blocks fronting on Frankfort street. The Bridge tracks at the station to be left at their present elevation—which is the second level, thirty feet above the street, and about fifteen feet higher than the tracks of the elevated railroad on the first level. This is necessary, to keep down the heavy grade to the Brooklyn Bridge.

The station will thus be arranged in two stories above the street level. With the electrical cars that is quite possible; with steam locomotives it would not have been possible, on account of the smoke and gas nuisance.

CAPACIOUS STATION PLATFORMS:

The train platforms in the new bridge station (see map C) to be so changed as to separate incoming from outgoing passengers, and to permit trains of six or more cars to stand on the station tracks. Trains from this station may be loaded and dispatched either over

the Brooklyn Bridge or the Williamsburg Bridge—circulating over both bridges during rush hours, every thirty seconds, in each direction.

The two tracks to be connected by "crossovers" near each end of the station, to permit trains to run from one track over to the other and return over the same bridge over which they arrived, if desired. The station may thus be used in case of necessity as an end station as well as a through station, as when there is a blockade, or in case of accident to a train, which otherwise would block the whole circulating system.

The present capacity of the bridge trains in rush hours is one four-car train every fifty-five seconds, or about 260 cars per hour, as the practicable maximum. In the new bridge station the practicable maximum will be about 720 loaded elevated cars for each bridge, or 1440 cars for both bridges, or five and one-half times the present capacity of the bridge trains on the Brooklyn Bridge. The stairways and platforms to be proportioned for the ready access and exit of such a dense traffic.

WILLIAMSBURG BRIDGE TERMINAL:

The Manhattan terminal for the Brooklyn Bridge will be, likewise, the terminal for the Williamsburg Bridge; and from this terminal passengers may go over to Brooklyn over either bridge.

Cars going in the direction of the Williamsburg Bridge will stop at Canal street and at Grand street, as well as on Delancey street at the entrance to the Williamsburg Bridge, and take on their quota of passengers at those stations. Cars coming from the Williamsburg Bridge and returning over the Brooklyn Bridge may be loaded in a similar manner—at Grand street, then at Canal street and at the Bridge station. Therefore, congestion of traffic at any point will be ordinarily impossible.

MANHATTAN BRIDGE TERMINAL:

The traffic over this bridge (see maps A and E) is to be independent from that which is to pass over the other bridges, in order to

avoid congestion at the Manhattan end. A two-track elevated railroad on Canal street will extend from the Bridge to West street, where there will be a loop around a small, triangular block. Canal street is a wide street, hence damages to property will not be so heavy. All four elevated railroads in Manhattan, namely, the Second Avenue, Third Avenue, Sixth Avenue and Ninth Avenue roads, will be passed overhead. Stations to be at all points of intersection, for the transfer of passengers from Manhattan Elevated Railroad trains to trains running over all these bridges, and vice versa.

The Manhattan Bridge and elevated railroad on Canal street will intersect every surface and elevated railroad running north and south on Manhattan Island. A passenger from any part of Manhattan Island may thus be able to reach any part of Brooklyn by one or two transfers. The Manhattan Bridge will have a function of its own. It will run through the wholesale dry-goods district in Manhattan, and will accommodate that part of the Brooklyn passenger traffic which cannot be so well accommodated over the two other bridges; namely, traffic to and from the central and upper parts of Manhattan. It will remain uncongested by that traffic from the City Hall region, which will find its outlet over the Williamsburg Bridge and the Brooklyn Bridge.

The Manhattan Bridge may, likewise, have a capacity of one six-car train every thirty seconds, or a total of 720 cars per hour on each track. For quick loading and unloading the stations on Canal street should have four tracks and at least three platforms.

BLACKWELL'S ISLAND BRIDGE TERMINAL:

In Manhattan, this terminal will be in the nature of track connections with the elevated railroad on Second avenue, which will provide ready access to the City Hall region. Elevated trains should be able to run to and from the City Hall station over the Second Avenue Railroad, and bring the region of Queens County—in point of time—as close to lower Manhattan as is lower Harlem, namely, within thirty to forty minutes' running time, for one fare of five cents.

ELEVATED VERSUS TROLLEY CARS :

It is believed that when the three lower East River bridges shall have been provided with the elevated railroad facilities above outlined, they will suffice to accommodate all the passenger traffic in non-rush hours several times over.

The electric trains can be run at from one to two-minute intervals, in units of one to six cars, at double the speed of surface cars. Elevated cars can run fast and give better service over the bridges than the surface cars. It can be easily arranged that passengers to Manhattan shall transfer everywhere in Brooklyn from surface cars to elevated trains at convenient points of intersection, without having to wait longer than one minute.

The trolley cars should preferably not cross the three bridges at all during rush hours. There is not sufficient room on the Manhattan side for adequate terminals for them, as proven by the experience on the Brooklyn Bridge. The electric cars in Brooklyn have the overhead trolley, while those in Manhattan can lawfully use only the underground trolley. The cars of one borough, therefore, unless equipped for both systems, cannot run upon the streets of the other borough.

There is plenty of room for an orderly system of trolley-car terminals in Brooklyn at the end of each bridge. Property there is much cheaper than in Manhattan.

In place of trolley cars on the several bridges, it is proposed to use, where the density of traffic during rush hours may justify it, moving platforms with seats.

MOVABLE PLATFORMS :

No means has yet been devised for the transport of local passengers in large numbers, and without a moment's waste of time, from start to finish of the trip, which can equal the movable platform.

Moving platforms were first constructed and operated in 1893 at the World's Columbian Exposition, held in Chicago. Later (in 1896) they were reproduced at Berlin, and again, in 1900, at Paris. (See views.)

The capacity of this device is very large, and depends on its speed and width. At ten miles per hour, 75,000 seated passengers can be readily transported. A seat on a moving platform is accessible the instant a person reaches the station. That most trying of all discomforts—waiting in a crowd—is, therefore, disposed of.

One track for a moving platform may be taken as equal to four tracks for crowded trolley cars, with this difference—that on the moving platform every passenger may have a seat, while in the trolley cars two-thirds of the passengers must stand!

The cars will run in a train, forming a continuous line and traveling at a speed of ten miles per hour. At each terminal will be an oval loop, and access to the cars may be gained by three platforms, each three feet wide, traveling inside the loops. The differential speeds at which these platforms travel may be $2\frac{1}{2}$, 5 and $7\frac{1}{2}$ miles per hour, respectively. Outgoing and incoming passengers can be kept separate.

The moving platforms will obviate entirely the dangerous and indecent crowding inseparable from the present system in use by the trolley lines.

Propositions have been made to the Commissioner of Bridges by responsible parties, to install moving platforms on one or more of the lower East River bridges without any cost to the city, guarantee the smooth and safe operation of the same, and pay to the city a reasonable rental.

TRANSPORTATION CAPACITY OVER THE THREE SUSPENSION BRIDGES, UNDER THE PROPOSED PLAN:

The present maximum capacity over the Brooklyn Bridge, per hour, is as follows:

Four-car train every 55 seconds, or 260 loaded cars per hour;

trolley cars, at present 240 cars, may be increased to 300 loaded cars per hour; total, 560 loaded cars per hour. These cars can carry about 40,000 passengers per hour, of which number only about 18,000 have seats.

The future maximum capacity will be had with: Six-car trains every 30 seconds, or 720 loaded cars per hour, carrying about 45,000 passengers; moving platforms, at ten miles per hour, with four seats abreast, about 75,000 passengers per hour, making a total of 120,000 passengers per hour, of whom at least 90,000 would have seats. This means three times the present transporting capacity of the Brooklyn Bridge, with five times greater seating capacity.

The Brooklyn Bridge can and should be made of equal track capacity with the other two suspension bridges, which will have tracks on two decks. The suspended superstructure should be rebuilt to have also two decks. The reconstruction cannot very well be undertaken before the Williamsburgh Bridge is completed, and possibly not before the Manhattan Bridge is opened to traffic about five to six years hence.

In course of time all three bridges will probably be equally frequented, having together a capacity in rush hours of 360,000 passengers, or nine times the present capacity.

In addition to these facilities there will be the two-track tunnel through Whitehall street, Manhattan, to Atlantic avenue, Brooklyn, with a maximum carrying capacity of about 720 cars, transporting 45,000 passengers per hour; one-half standing. So that the future carrying capacity from the City Hall region of Manhattan to Brooklyn, over these three bridges and through the Whitehall tunnel, would reach 405,000 passengers per hour, or over ten times the present maximum carrying capacity of the Brooklyn Bridge, which is now the only all-rail avenue to Brooklyn. With such facilities in rush hours, congestion of traffic cannot occur—at least not on the three bridges—for generations to come.

ESTIMATES OF COST AND RENTALS:

At this time only round figures can be given. For a more accurate estimate fully worked out detail plans are required.

The additional property needed for the Bridge Station is shown on Plan C, and consists of the so-called triangle north of it between Park row and William street, and the block fronting on Tryon row and Centre street.

It is doubtful whether any of that property can be obtained without condemnation. The market value of these two blocks is quoted at widely differing figures, but is here assumed at \$4,000,000.

Alterations and Enlargement of the Brooklyn Bridge Station and Manhattan Elevated Railroad Station on the old and new property to a height about 50 feet above street level—combined Bridge and Manhattan Elevated Railroad terminal, \$1,000,000.

It should be noted here, that the Metropolitan Traction Company may desire accommodation in the station at the street level, and that the Rapid Transit Subway Company may desire accommodation in the Bridge station below the street level.

Elevated Railroad, reconstruction on Park row and the Bowery, from Chambers street to Delancey street, and extension on Delancey street, including damages to property along the line, \$2,500,000.

The Elevated Railroad on Canal street as an extension of the Manhattan Bridge with stations, including damages to property, \$1,400,000.

Of the above item for property (\$4,000,000) one-half may be taken as applied to station use and the other half to the use of an office building.

The combined Bridge and Manhattan Elevated Railroad Station would therefore be: For property, \$2,000,000; for construction, \$1,000,000; together \$3,000,000.

The annual rentals on that cost would amount for the station (4% on \$3,000,000), \$120,000; for the Elevated Railroad (4% on \$2,500,000), \$100,000; total, \$220,000; to be divided between the

Manhattan Elevated, the Brooklyn Rapid Transit and any other participating transportation companies in proportion to their traffic, and as may be determined between themselves.

In addition thereto would be taxes and cost of maintenance, and as an offset should be noted the interest on the sum required for the purchase of existing elevated structures, as far as they would be replaced, but which are of comparatively little value.

The rentals to the city for the Brooklyn and Williamsburg Bridges and their respective appurtenances and stations should be agreed upon with the Brooklyn Rapid Transit Company, in connection with the other before mentioned rentals before the improvement for permanent relief is commenced.

Additional property on Frankfort street (having an assumed market value of \$800,000) will be required later for the installation of the moving platform loop station, which may take the place of or be in addition to, the trolley cars and trolley terminals. The expense of that installation, except the building, is not expected to come upon the city. The space above the station building, to be erected upon this ground, can also be used at some future time for the extension of the before-mentioned office building which would save to the city the rental of about \$360,000 per year, now being paid for offices in the City Hall region of Manhattan Borough.

The rentals for the Manhattan Bridge and the Elevated Railroad on Canal street need not be considered until the bridge shall be nearing completion, four or five years hence.

PAYMENT FOR PROPOSED IMPROVEMENT:

The improvements may be paid for either by the City, or by one or several of the transportation companies who desire to profit by it. The City owns the present bridge station. The ownership of the enlargement by one or the other transportation company, would deprive the City of a great advantage in the control of what it already owns. The title to all the property and improvements should be in the City under any circumstances.

The purchase and reconstruction of the Elevated Railroad on

Park row and the Bowery to Delancey street, it is believed, can be brought about by negotiation with the Manhattan Elevated Railroad Company. If not, then legislation to that end may become necessary. The City should have adequate guarantees before the work is begun for the rentals and other compensation to be paid by the companies to be benefited by the improvements.

The city not being always in good financial condition as regards needed money for large public improvements (on account of the constitutional debt limit), it may become advisable that the funds for the improvement, be furnished by one or several of the railroad companies. In that case an arrangement may be worth consideration under which the title would be vested in the City, and the City could gradually repay the money advanced by rebates on the annual rentals to be paid by the companies. In that way the entire improvement could be built without any appropriation on the part of the City.

LEGALITY OF PROPOSED PLAN:

It is thought that the enlargement of the present bridge station and the acquisition of property for same can be carried out under the so-called McCarren Act, and that for the reconstruction, enlargement and extension of the Elevated Railroad from Chambers street along Park row, the Bowery and Delancey street, the necessary powers can be obtained under the Rapid Transit Act on application to the Board of Rapid Transit Commissioners.

To this application the Manhattan Elevated Railroad Company would appear to be a necessary party, and it is proper to mention that that company, through one of its officers, has intimated its willingness to co-operate in the proposed plans, and to pay its share of the cost to be determined.

For the Elevated Railroad on Canal street, application to the same board would appear to be necessary either by the City through an authorized agent or by a separate corporation, to whom the City would be willing to grant the franchise and privilege of transportation over the Manhattan Bridge.

Should the proceedings disclose a deficiency of legal powers for carrying out the plans in one or the other form, then application can be made to the legislature for the proper legal powers at its next session.

If the consideration of the plans before the Rapid Transit Commission should indicate the advisability of their modification, that body, it is believed, has the power to do so. The occasion for a free discussion of the plans before an authoritative body should be welcomed by all the interests affected by them.

ORDER IN WHICH THE WORK SHOULD BE CARRIED OUT:

(1) To relieve the congestion at the surface-car loops, during the time that the permanent bridge station is building, four additional loops to be put in, or such other plan to be carried out during the summer as the Brooklyn Rapid Transit Company may elect, without delay. The plans must be furnished and the expense of such relief measures will have to be paid by that company under its contract with the City.

(2) The additional property at Park row and Tryon row to be acquired, and the several floors for station purposes to be built and temporarily covered. The foundations of such structure to be large enough to carry an office building on top of the station, in the future.

(3) The elevated railroad from Chambers street to Delancey street to be rebuilt and enlarged to four and six tracks, respectively.

(4) The two-track Elevated Railroad on Delancey street from the Bowery to the Williamsburg Bridge to be built at the same time, and completed within eighteen months.

(5) Last of all, the erection of the two-track Elevated Railroad and four-track stations on Canal street, in continuation of the Manhattan Bridge, to be completed some four to five years hence.

GUSTAV LINDENTHAL,

Commissioner of Bridges.

New York, April 21st, 1902.

A

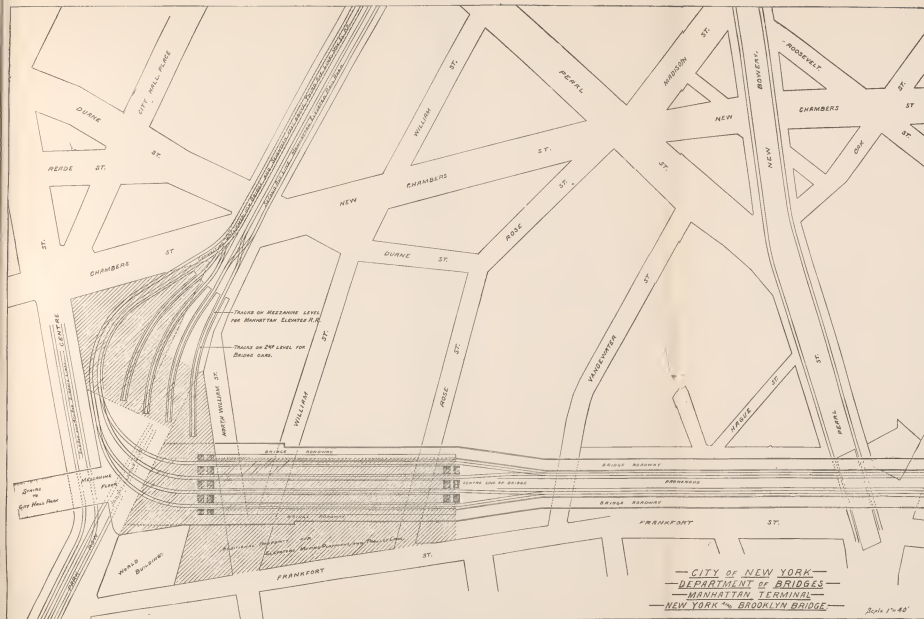


Plan of elevated railroad connections between the Brooklyn and Williamsburg Bridges; showing also the elevated railroad extension on Canal Street, which will serve as an approach to the Manhattan Bridge.



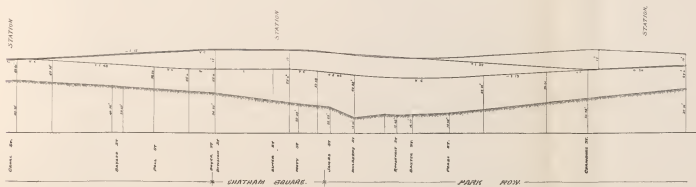
Plan of elevated railroad and stations for the Brooklyn Bridge terminus, the City Hall terminus of the Manhattan Elevated Railroad, the Williamsburg Bridge terminus on the level above the Manhattan Elevated Railroad; also the overhead crossing at Canal Street for the approach to the Manhattan Bridge.

C



Plan of terminal for the Brooklyn Bridge, the Williamsburg Bridge and the Manhattan Elevated Railroad station at City Hall Park, New York

A hand-drawn cross-section diagram of a road or canal. The diagram shows a central channel or road bed with a curved top surface. The left side is labeled "STATION" and the right side is labeled "STATION". Below the diagram, there are labels for "DELAWARE ST." and "BOWERY". The diagram is divided into sections by vertical lines, with some sections labeled "STATION" and others "DELAWARE ST.".



NON-VOLTERE. *Edizione* 1 anno = 124 pagg. *Prezzo del volume* Lit. 1.000.

图例: 公路、铁路、河流、湖泊、水库、沼泽、森林、草原、耕地、其他用地

27 Apr 1961

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PROPOSED ELEVATED R.R.
CONNECTION OF BRIDGES NO. 1, 2 & 3.

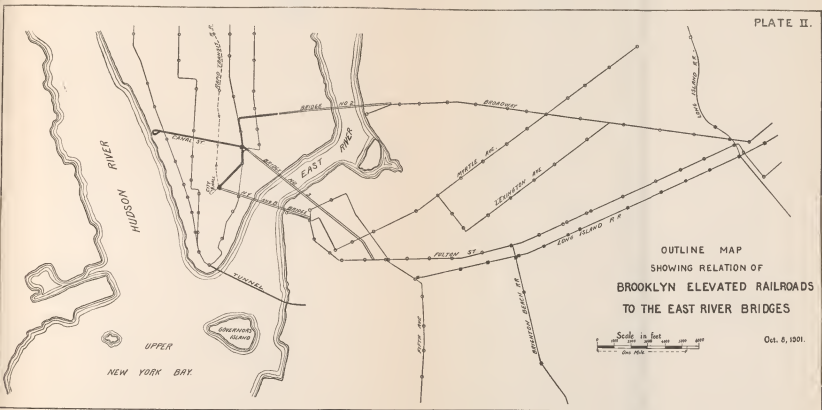
March 5, 1902

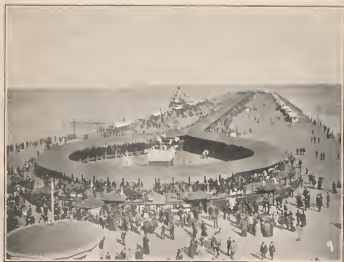
Рисунки №2

Profile of elevated railroad tracks, showing how grade-crossing is avoided at the Chatham Square station ; also showing the track-levels at the Brooklyn Bridge terminal.

E

PLATE II.





MOVING PLATFORM WITH SEATS AT THE CHICAGO WORLD'S FAIR, 1893



MOVING PLATFORM AT THE CHICAGO WORLD'S FAIR, 1893



MOVING PLATFORM WITHOUT SEATS AT THE PARIS EXPOSITION, 1900

DATE DUE

JAN 12 2004

JUN 03 2013

GAYLORD

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